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Original Research Article

Causality assessment and the severity of the adverse drug reactions in tertiary care hospital: a pharmacovigilance study

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ABSTRACT

Background: Adverse drug reactions (ADRs) constitute a major clinical problem in terms of human suffering and increased health care costs. To study the adverse drug reactions reported in a tertiary care hospital and study of causality assessment and severity of adverse drug reaction (ADR) cases reported.

Methods: A prospective observational study was conducted as part of pharmacovigilance program over 12months between September 2015 and August 2016. Adverse drug reactions reported from hospital were filled into Suspected ADR - CDSCO forms and submitted to pharmacovigilance unit. Causal relationship was assessed and categorized by Naranjo's algorithm and WHO - UMC causality scale. The severity of each ADR was assessed using Modified Hartwig and Siegel scale.

Results: Total 120 cases were reported over 12 months. Among them, 66% were in males and 55% were in females. The majority of ADRs were due to antimicrobial agents (40.78%) followed by haematinics (12%) and anti-epileptics (10%). Maximum number of patients (30.25%) reported with dermatological manifestations. Highest number of ADRs was reported from the department of medicine (45%). As per Naranjo's scale, 54% reports were assessed as probable and 46% classified as possible. Majority of cases were mild to moderate in severity.

Conclusions: The pattern of ADRs reported in our hospital is similar with the pattern of studies conducted in other hospitals elsewhere. This study provides a database of ADRs due to commonly used drugs in our hospital, which will help clinicians for their optimum and safe use. Hence effective pharmacovigilance is required for the use of these drugs and their safety assessment.

Keywords: Adverse drug reactions, Causality assessment pharmacovigilance, Spontaneous reporting

INTRODUCTION

Adverse drug reactions (ADRs) constitute a major clinical problem in terms of human suffering and increased health care costs.[1] World Health Organization (WHO) defines an ADR as any noxious, unintended, and undesired effect of a drug, which occurs at doses used in humans for prophylaxis, diagnosis, or cure of a disease.[2] ADRs are responsible for 5-11% of hospital admissions of which 60-70% are preventable.[3,4] Spontaneous reporting has contributed significantly to successful pharmacovigilance.[5] The aim was to study the adverse drug reactions reported in a tertiary care hospital and causality assessment and severity of adverse drug reaction (ADR) cases reported with the main objective of creating awareness among the health care professionals and patients on adverse drug reactions and their reporting. The implementation of ADR monitoring based on spontaneous reporting will be useful for the detection and evaluation of ADRs associated with increase in morbidity and duration of hospitalization.

METHODS

This was a prospective observational study conducted at ADR monitoring center of Karnataka Institute of Medical Sciences and Hospital, Hubballi, Karnataka. The study

was carried out over a period of 12 months from September 2015 to August 2016. A total of 120 cases reported over a period of 12 months were included in the study.

Inclusion criteria

- Patients of all age, both genders, seeking treatment at KIMS Hubballi and developed ADRs.
- Patients willing to give written informed consent.
- Suspected adverse drug reactions reported to the ADR monitoring center

Exclusion criteria

- Patients who were not willing to participate in the study.

Study procedure

The suspected adverse drug reactions reported to the pharmacovigilance center were filled into CDSCO spontaneous ADR reporting forms. Causal relationship was assessed and categorized by Naranjo's algorithm and WHO-UMC causality scale.[6] The severity of each reported ADR was assessed using the criterion developed by modified Hartwig and Siegel scale.[7] All values were expressed in percentages and depicted using tables and charts.

RESULTS

A total of 120 ADRs were reported over 12 months. Of these, 55% were in males and 45% were in females (Table 1).

Table 1: Gender-wise distribution of ADRs.

Gender	Number of cases (120)	Percentage (%)
Male	66	55%
Female	54	45%

Table 2: Department-wise distribution of ADRs.

Department	No. of ADRS	Percentage (%)
Medicine	54	45
Obg	25	20
Surgery	13	10.8
Psychiatry	8	6.7
Dermatology	7	5.8
Pediatrics	6	5
Ent	3	2.5
Ophthalmology	2	1.7
Orthopedics	2	1.7
Total	120	100

Highest number of ADRs reported in the age group of 21-30 years of age followed by 41-50 years of age group (Figure 1).
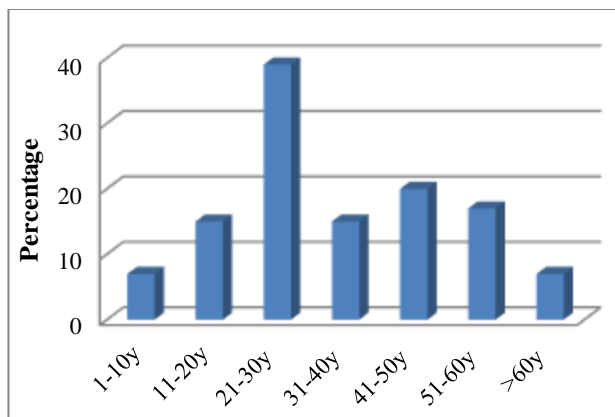

Figure 1: Age wise distribution of ADRs.

Maximum number of cases were reported from the department of medicine (45%) followed by obstetrics and gynecology (20%) and department of surgery (10.8%). (Table 2).

Among the suspected drugs causing ADRs, antimicrobial agents (AMAs) accounted for 52% of the total cases followed by CNS drugs and hematinics which were implicated in 12% of cases each (Figure 2). The most common adverse drug reactions involved skin and appendages (28%) and gastrointestinal system (26%) (Figure 3).
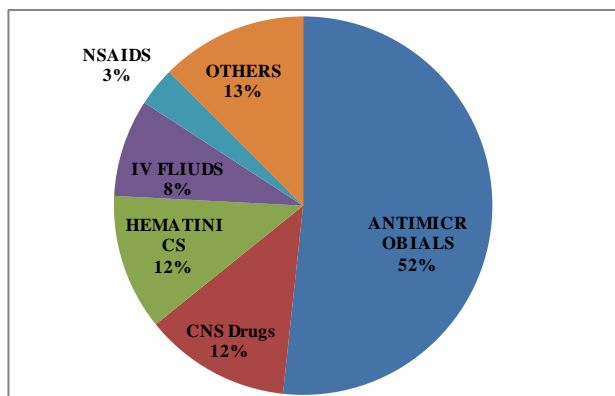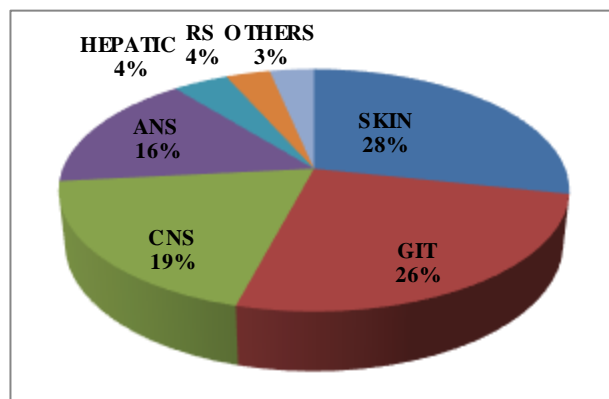

Figure 2: ADRs in various drug classes (%).

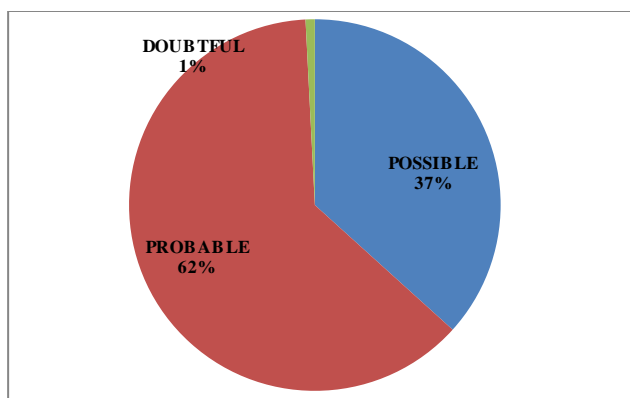**Figure 3: Organ systems involved in ADRs (%).**

Figure 4: Causality assessment using Naranjo's algorithm.

Assessment of ADRs using Naranjo's causality assessment scale showed that 62% of ADRs were probable, 37% were classified as possible and 1% were unlikely to have occurred due to drug administration (Figure 4). WHO-UMC probability assessment scale revealed that out of 120 cases, 54% were probable and 45% were possible/ likely (Table 3). Reported ADRs were mainly mild to moderate in severity (Table 4).

Table 3: WHO-UMC assessment scale.

Type of reaction	Percentage (%)
Certain	0%
Probable/ likely	54%
Possible	45%
Unlikely.	1%
Conditional/ unclassified	0%
Unassessable/unclassifiable	0%

Table 4: Severity assessment by modified hartwig and Siegel scale.

Type or severity of ADRs	Number of cases	Percentage (%)
Mild	46	38.33
Moderate	68	56.66
Severe	06	5
Lethal	0	0

DISCUSSION

In our study demographic profile showed that out of 120 cases reported, 55% were males and 45% were females which showed similar trend as in the study done by Shrivastava M et al.[8] Majority of patients were in the age group of 21-30 years followed by 31-40 years of age group. It could be due to the reason that population of this age group is attending hospital more frequently and receiving drug therapy.

The highest number of cases were reported from the department of medicine which is in accordance with study done by Ponnusankar et al and Murphy B et al.[9,10] The maximum reports were reported to use of antimicrobial agents (AMAs), which is in accordance with the result of studies done by Murphy B et. al and Lukshmy M Hettihewa et al.[10,11] The most commonly effected organ system was skin and gastrointestinal tract which is in accordance with other such studies done by Shrivastava M et al, and Chan AL et al.[8,12] Rash, itching and nausea, vomiting and gastritis were the most common symptoms presented with and would lead to increased cost of health care and prolong the hospital stay.[13]

Assessment of the ADRs using Naranjo's scale showed that 67.5% of cases were classified as probable, 57% were possible and 1% of cases were in doubtful category. On assessment of ADRs by using WHO-UMC causality assessment scale the number of certain cases were 0% as no Dechallenge was done, 54% were possible/ likely, 45% were possible and 1% classified as unlikely.

Severity Assessment by Modified Hartwig and Siegel Scale showed that 68 (56.66%) ADRs were moderate, 46 (38.33%) ADRs were mild and 6 (5%) ADRs were severe. No lethal effects were produced. Our study provided the database of ADRs due to commonly used drugs and monitoring and detection of such known ADRs by effective implementation of pharmacovigilance and would lead to prevention and better management of ADRs.[13,14]

CONCLUSION

The pattern of ADRs reported in our hospital is comparable with the results of studies conducted in hospital set up elsewhere. Antimicrobial agents were causing maximum ADRs. This study provides a database of ADRs due to common drugs used in our hospital, which will help clinicians for optimum and safe use of these drugs. Hence effective implementation of pharmacovigilance would result in better strict vigilance use of these drugs and their safety assessment which would ultimately result in better patient care.

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